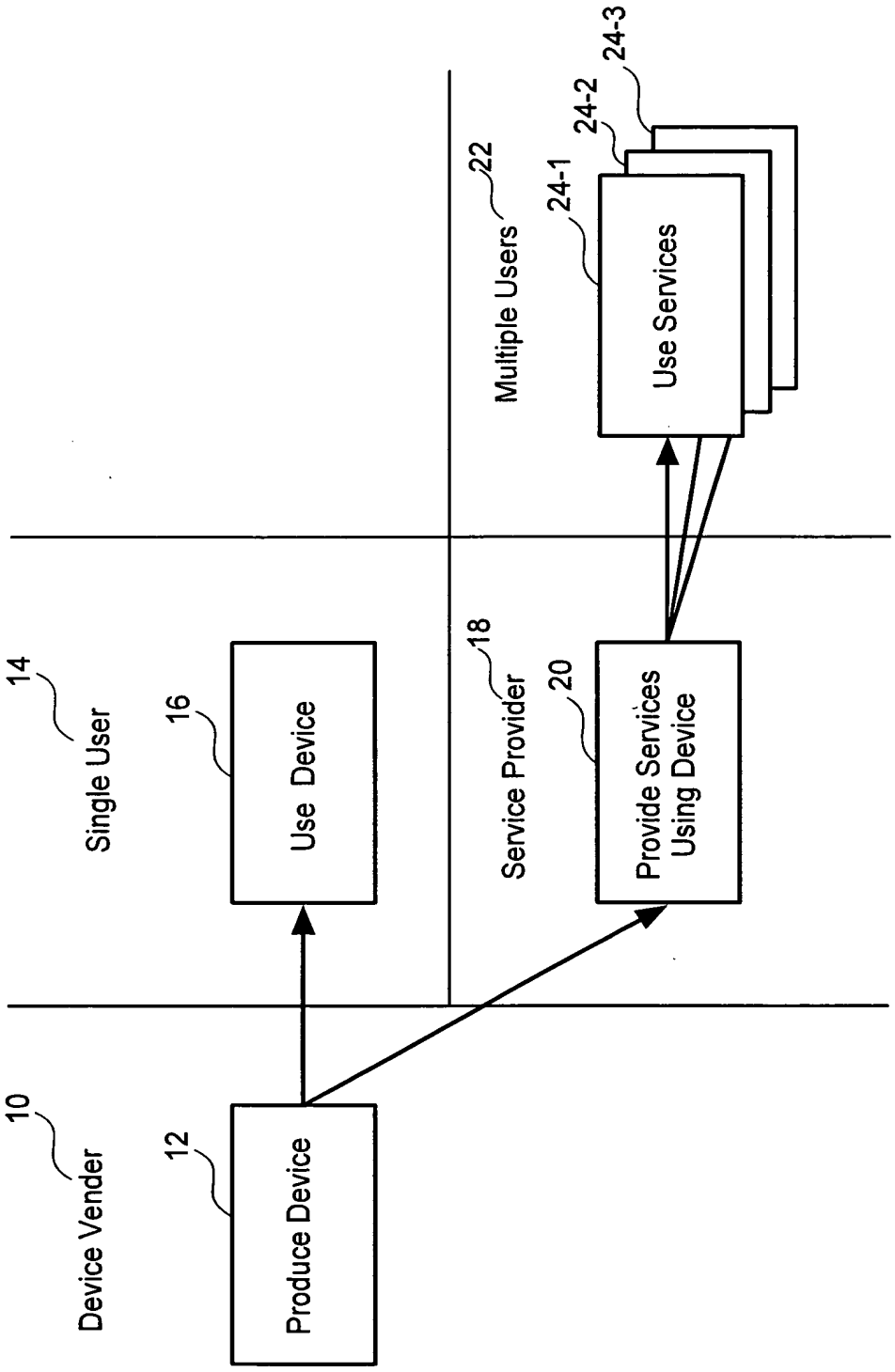
FIG.1


10
Device Vender
12
Produce Device
14
Single User
16
Use Device
18
Service Provider
20
Provide Services Using Device
22
Multiple Users
24-1
24-2
24-3
Use Services

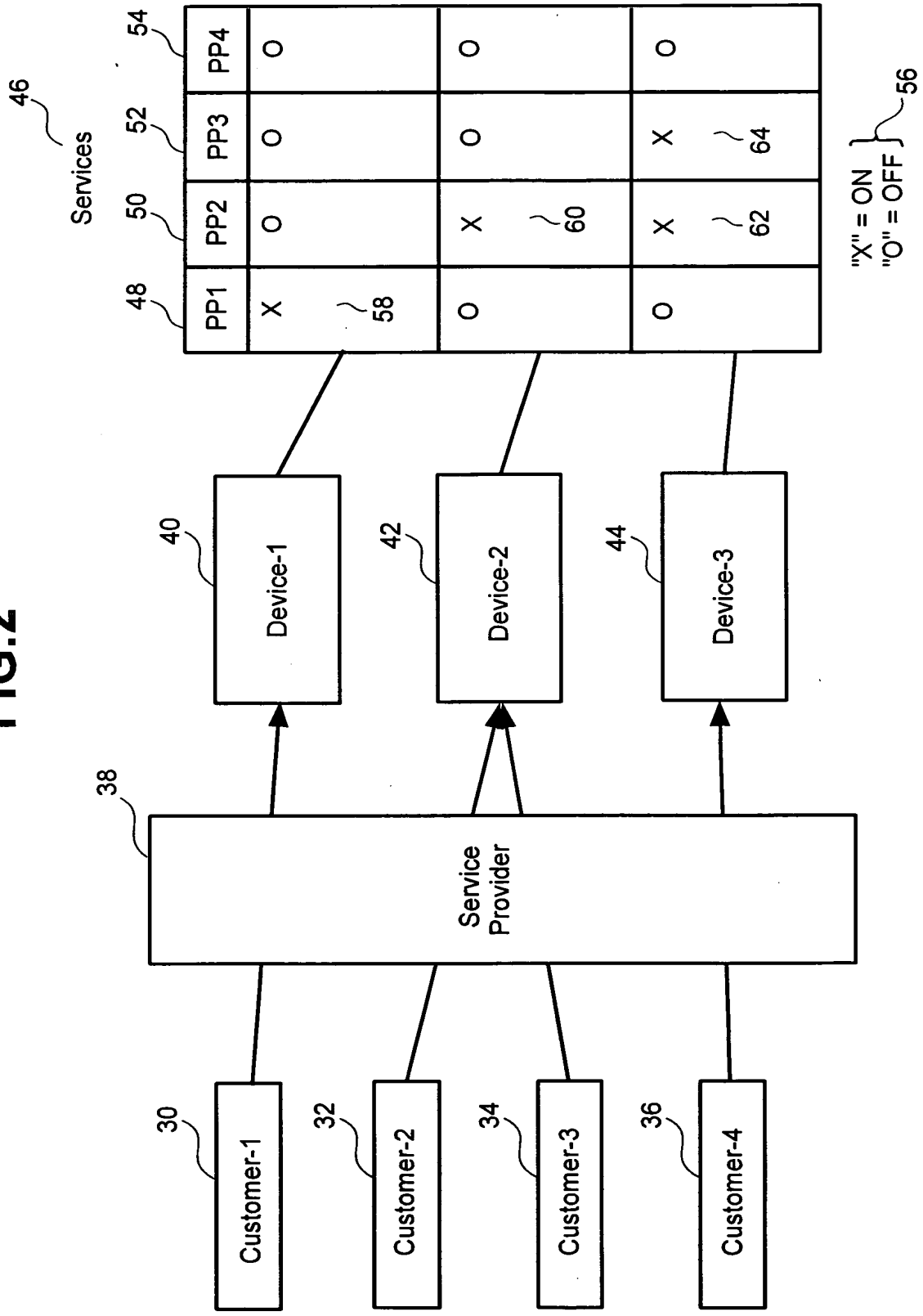

46
Services
54
52
50
48
PP4
PP3
PP2
PP1
O
X
58
60
62
64
56
"X" = ON
"O" = OFF
40
42
44
Device-1
Device-2
Device-3
38
Service Provider
30
32
34
36
Customer-1
Customer-2
Customer-3
Customer-4

FIG.2

FIG.3

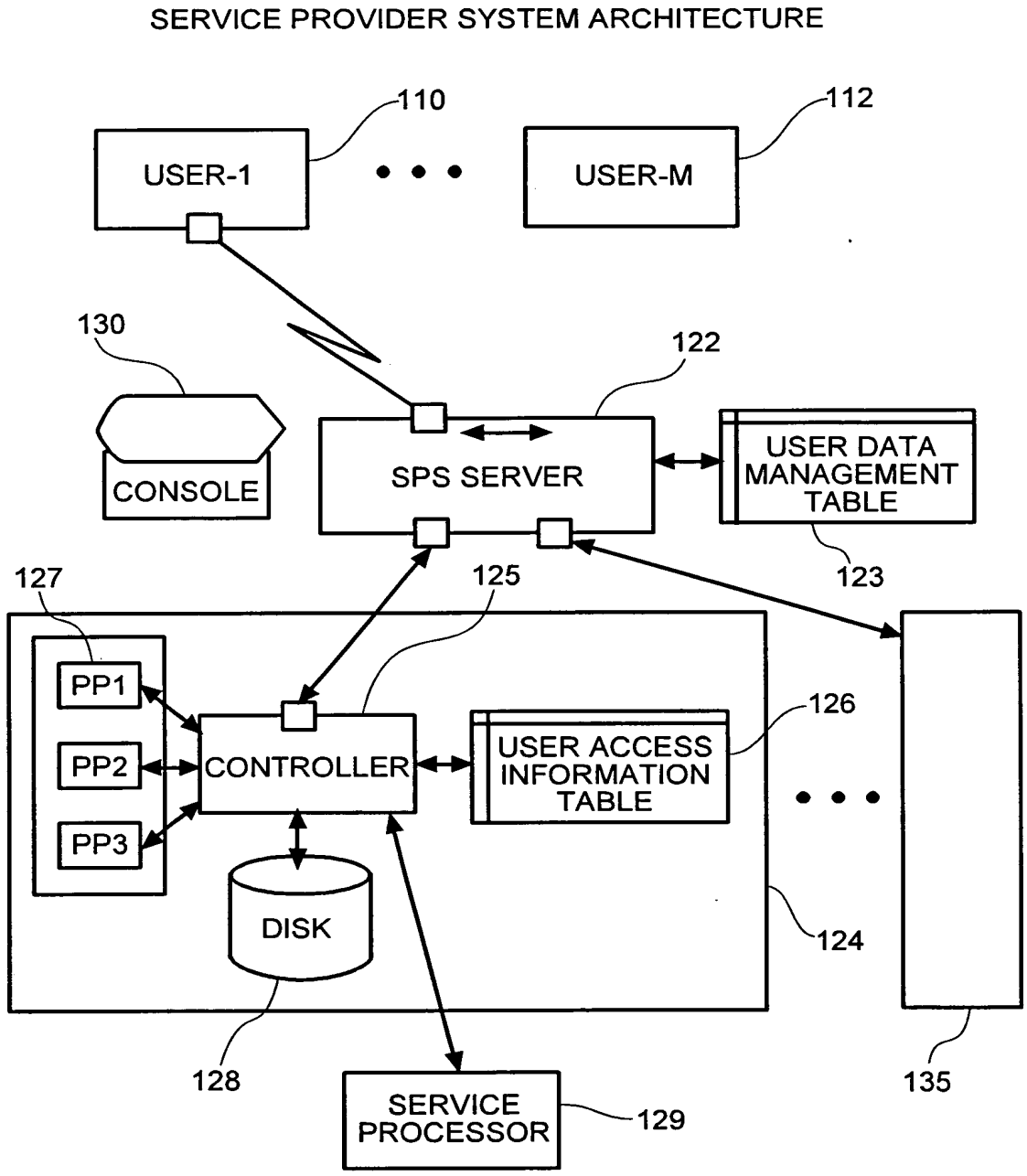

SERVICE PROVIDER SYSTEM ARCHITECTURE
110
112
USER-1
USER-M
130
122
CONSOLE
SPS SERVER
USER DATA MANAGEMENT TABLE
123
127
125
PP1
PP2
PP3
CONTROLLER
126
USER ACCESS INFORMATION TABLE
DISK
124
128
135
SERVICE PROCESSOR
129

FIG.4

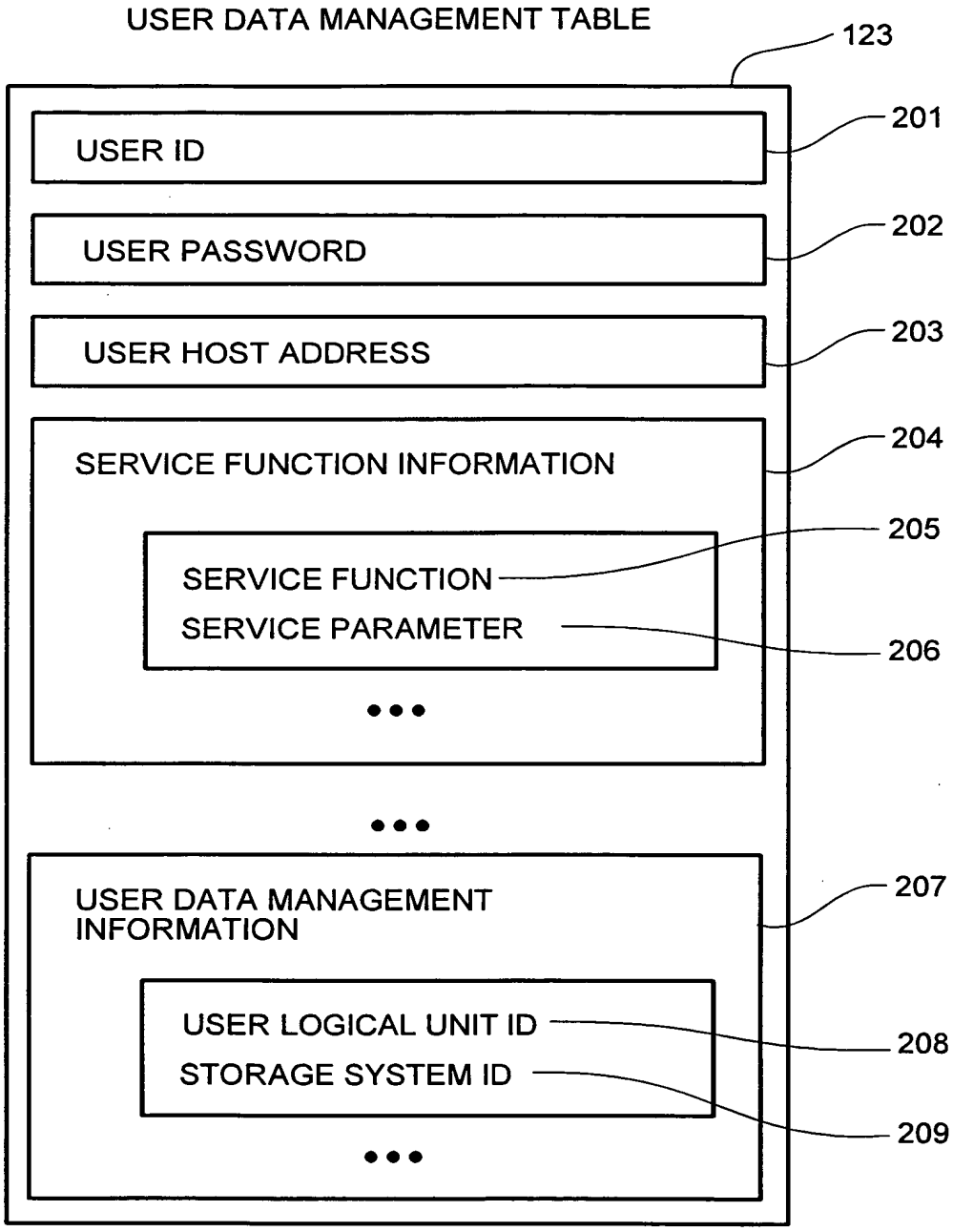

USER DATA MANAGEMENT TABLE
123
USER ID
201
USER PASSWORD
202
USER HOST ADDRESS
203
SERVICE FUNCTION INFORMATION
204
SERVICE FUNCTION
205
SERVICE PARAMETER
206
USER DATA MANAGEMENT INFORMATION
207
USER LOGICAL UNIT ID
208
STORAGE SYSTEM ID
209

FIG.5

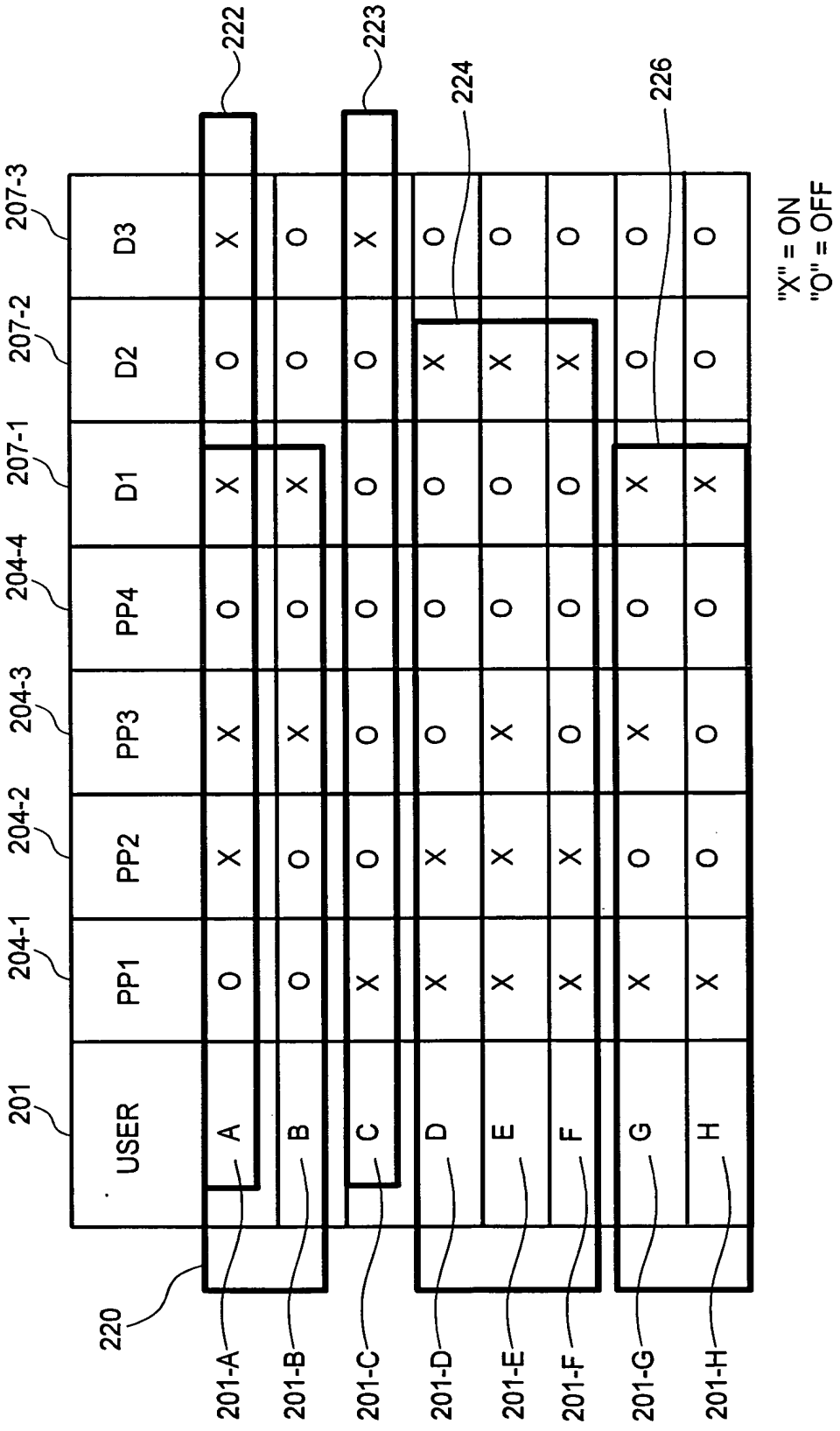

201
USER
204-1
PP1
204-2
PP2
204-3
PP3
204-4
PP4
207-1
D1
207-2
D2
207-3
D3
220
222
223
224
226
A
B
C
D
E
F
G
H
201-A
201-B
201-C
201-D
201-E
201-F
201-G
201-H
"X" = ON
"O" = OFF

FIG.6

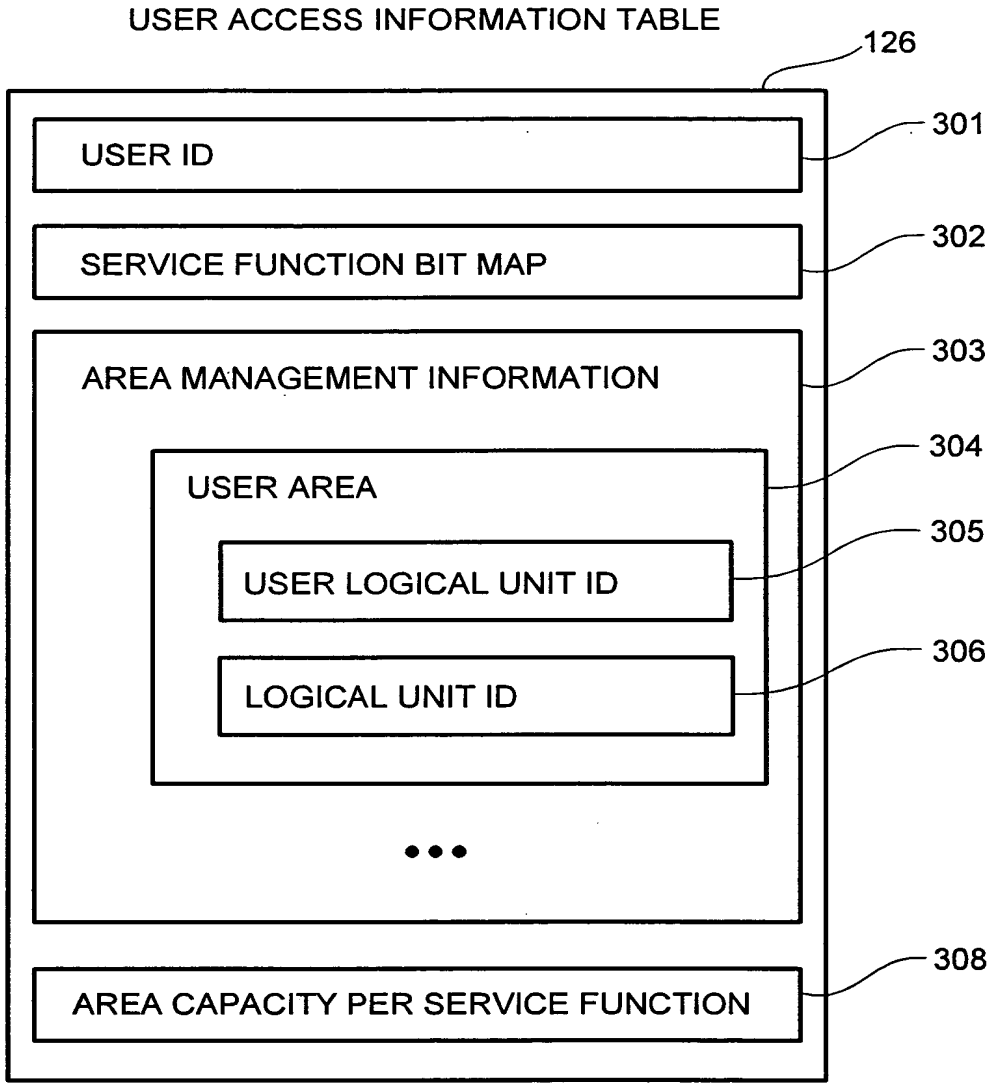
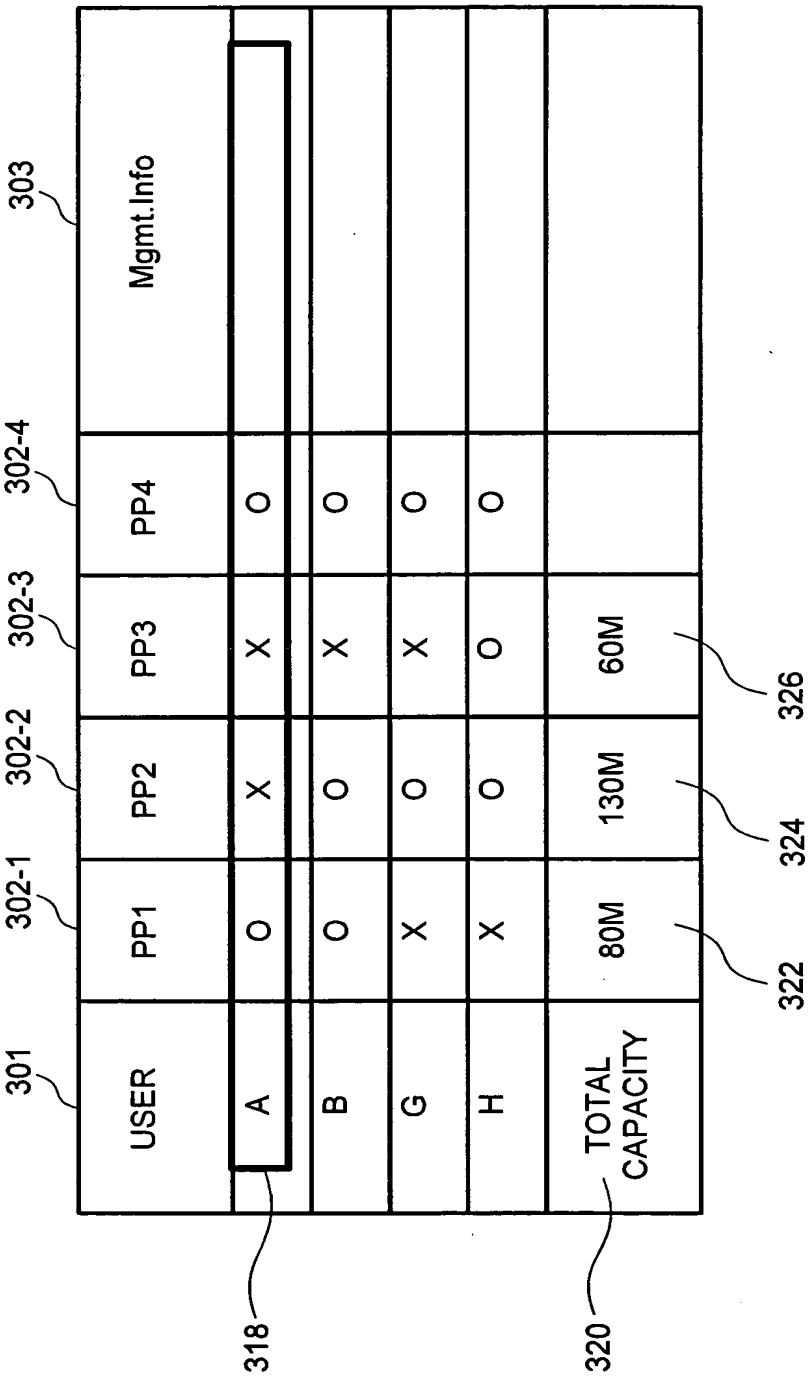

USER ACCESS INFORMATION TABLE
126
USER ID
301
SERVICE FUNCTION BIT MAP
302
AREA MANAGEMENT INFORMATION
303
USER AREA
304
USER LOGICAL UNIT ID
305
LOGICAL UNIT ID
306
AREA CAPACITY PER SERVICE FUNCTION
308

FIG.7


301
USER
302-1
PP1
302-2
PP2
302-3
PP3
302-4
PP4
303
Mgmt.Info
A
O
X
X
O
B
O
O
X
O
G
X
O
X
O
H
X
O
O
O
TOTAL CAPACITY
80M
130M
60M
322
324
326
318
320

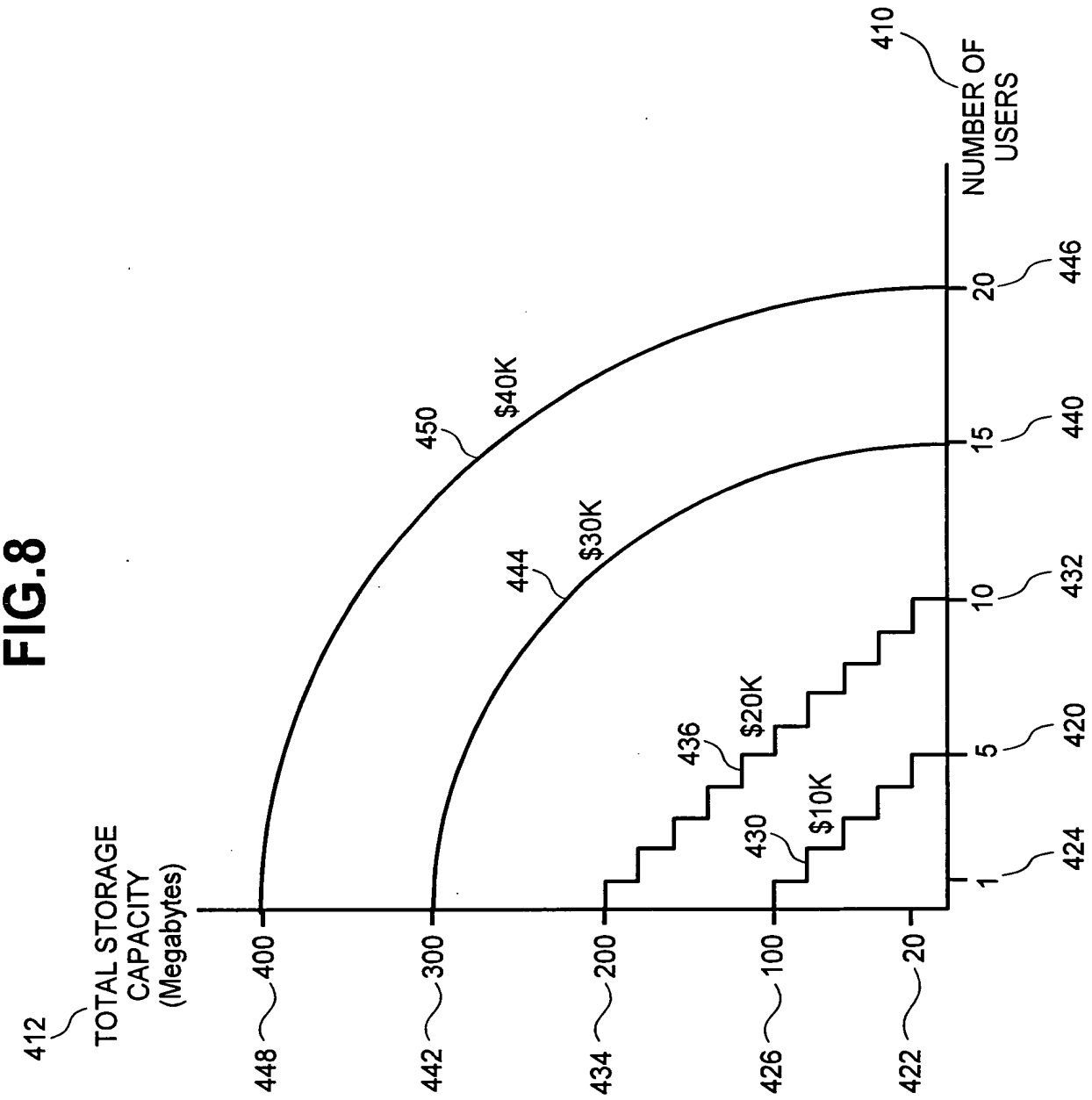

410
NUMBER OF USERS
446
20
440
15
432
10
420
5
424
1
$40K
450
$30K
444
$20K
436
$10K
430
412
TOTAL STORAGE CAPACITY (Megabytes)
448
400
442
300
434
200
426
100
422
20

FIG.8

FIG.9

SERVICE PROVIDER SERVER OPERATION IN RESPONSE TO RECEIVED CUSTOMER ACCESS COMMAND

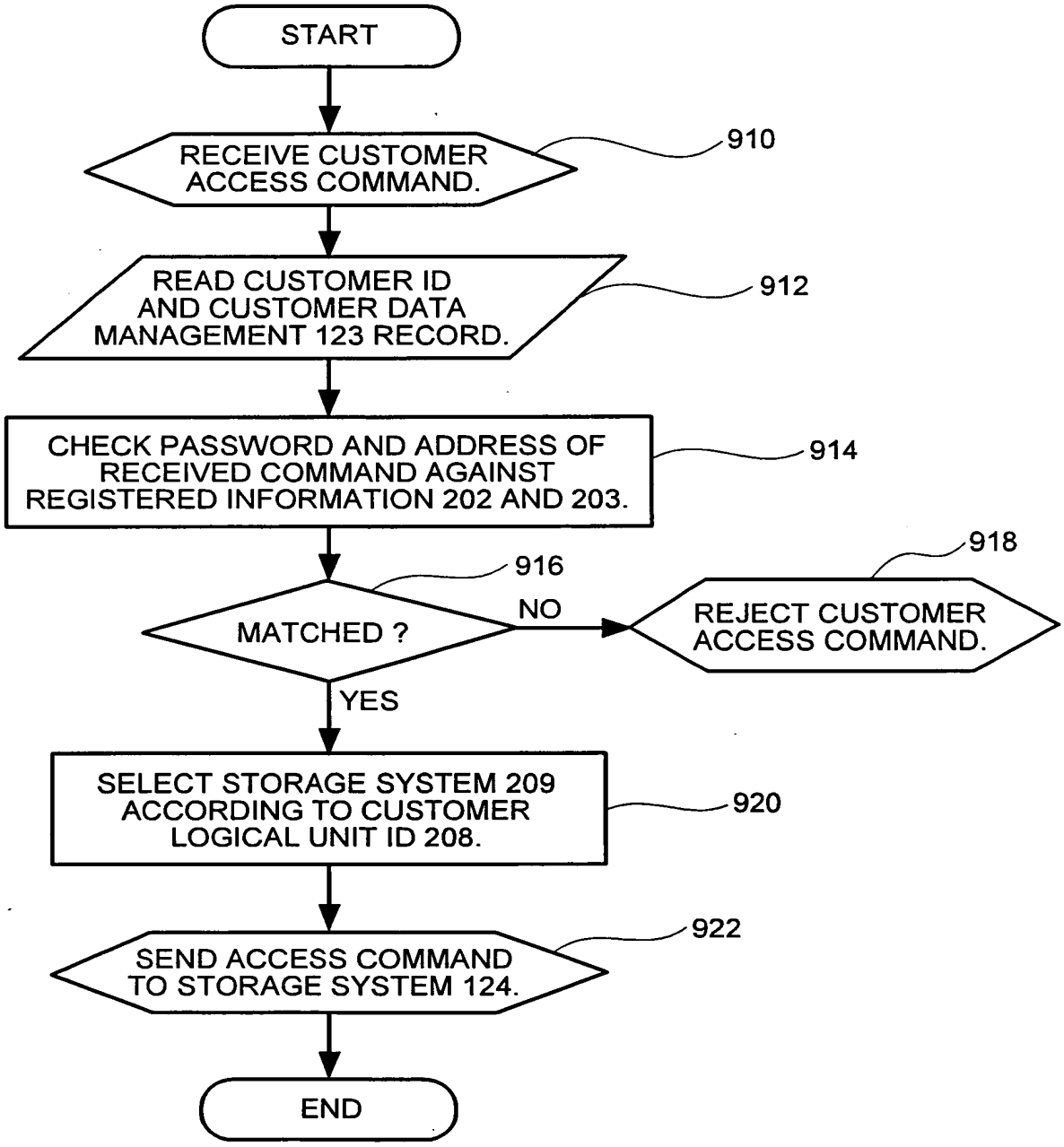


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FIG.10

SERVICE PROVIDER SERVER OPERATION IN RESPONSE TO RECEIVED CUSTOMER SERVICE COMMAND

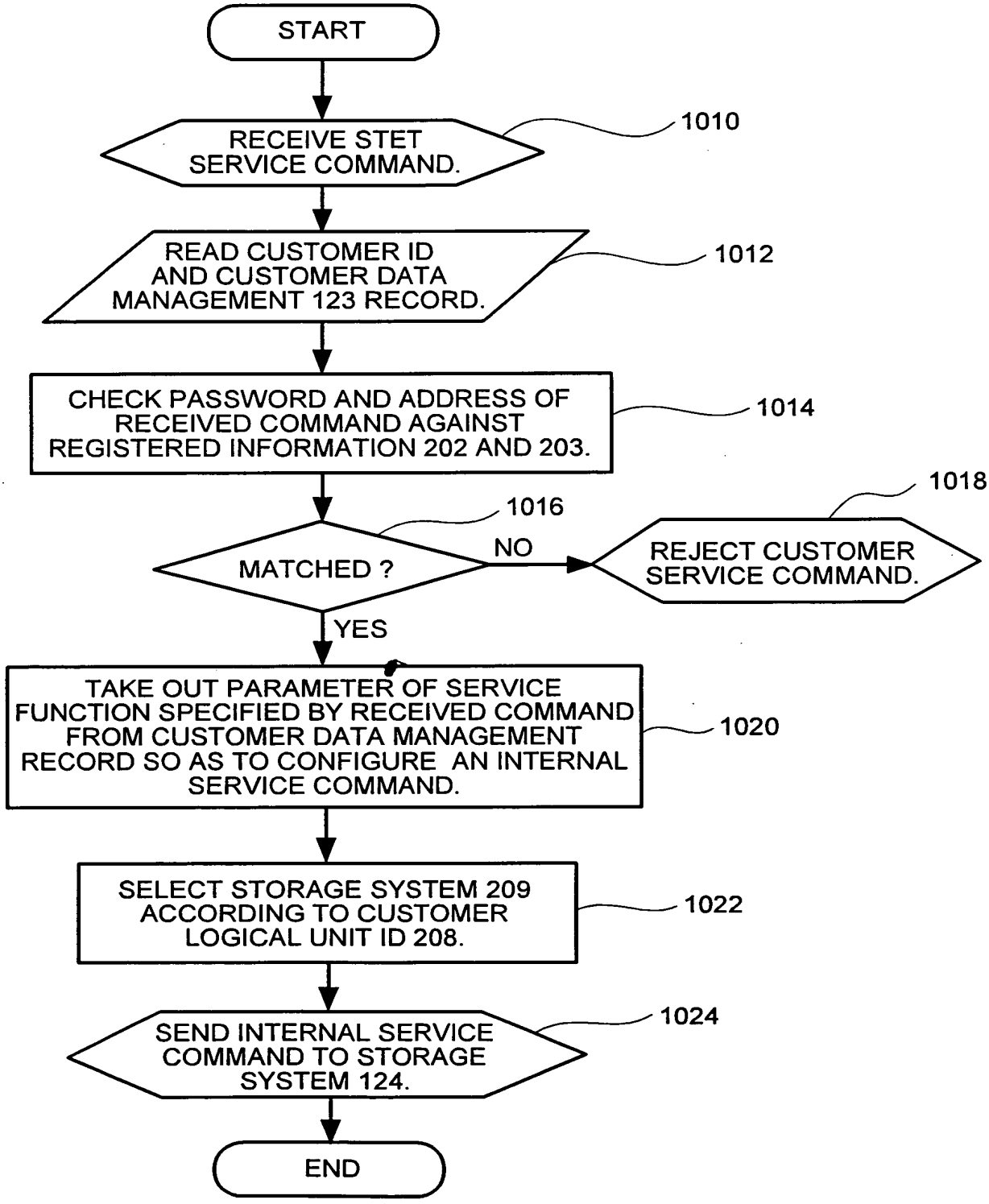

FIG.11

STORAGE CONTROLLER OPERATION IN RESPONSE TO RECEIVED SERVICE COMMAND

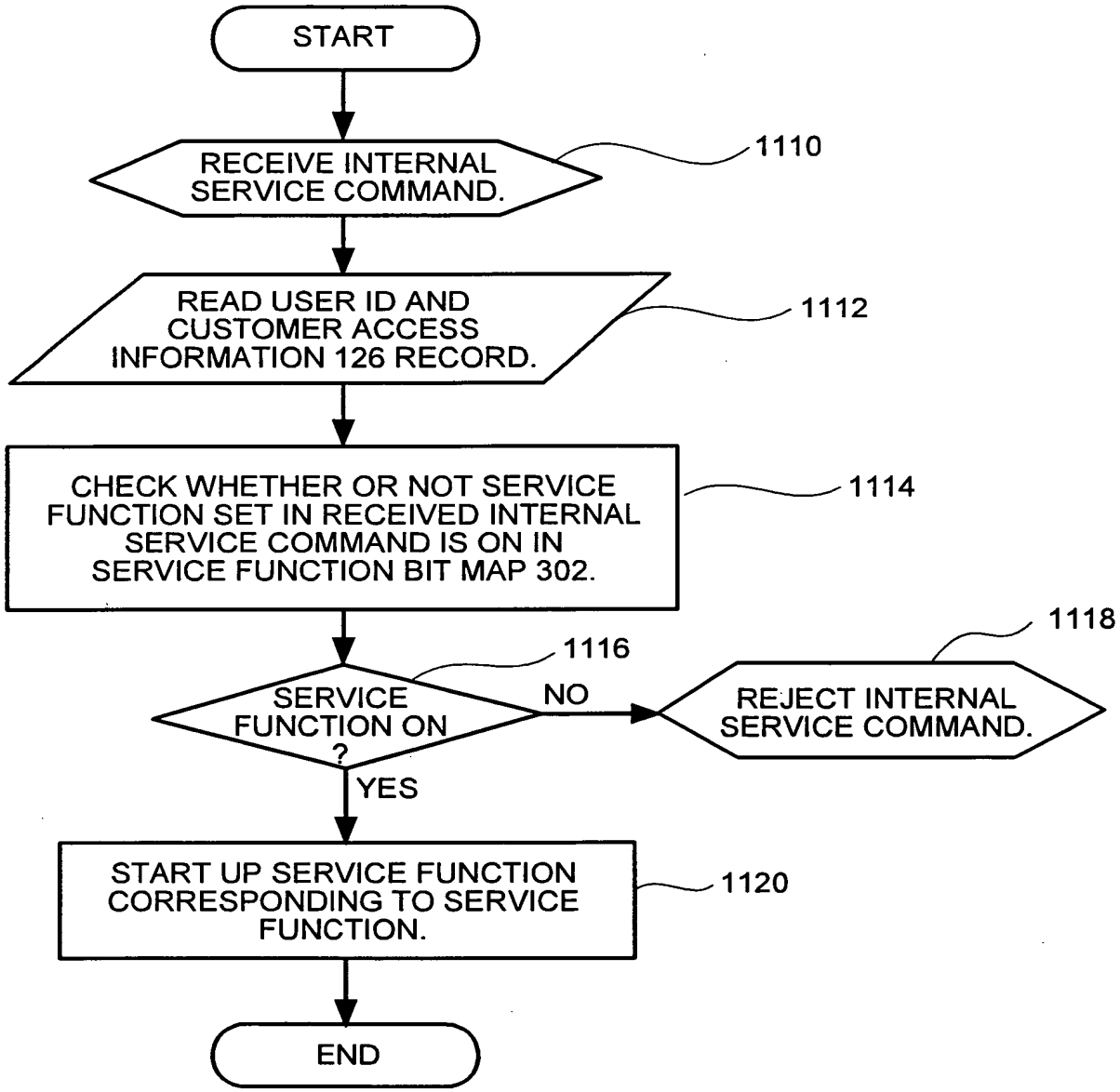

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FIG.12

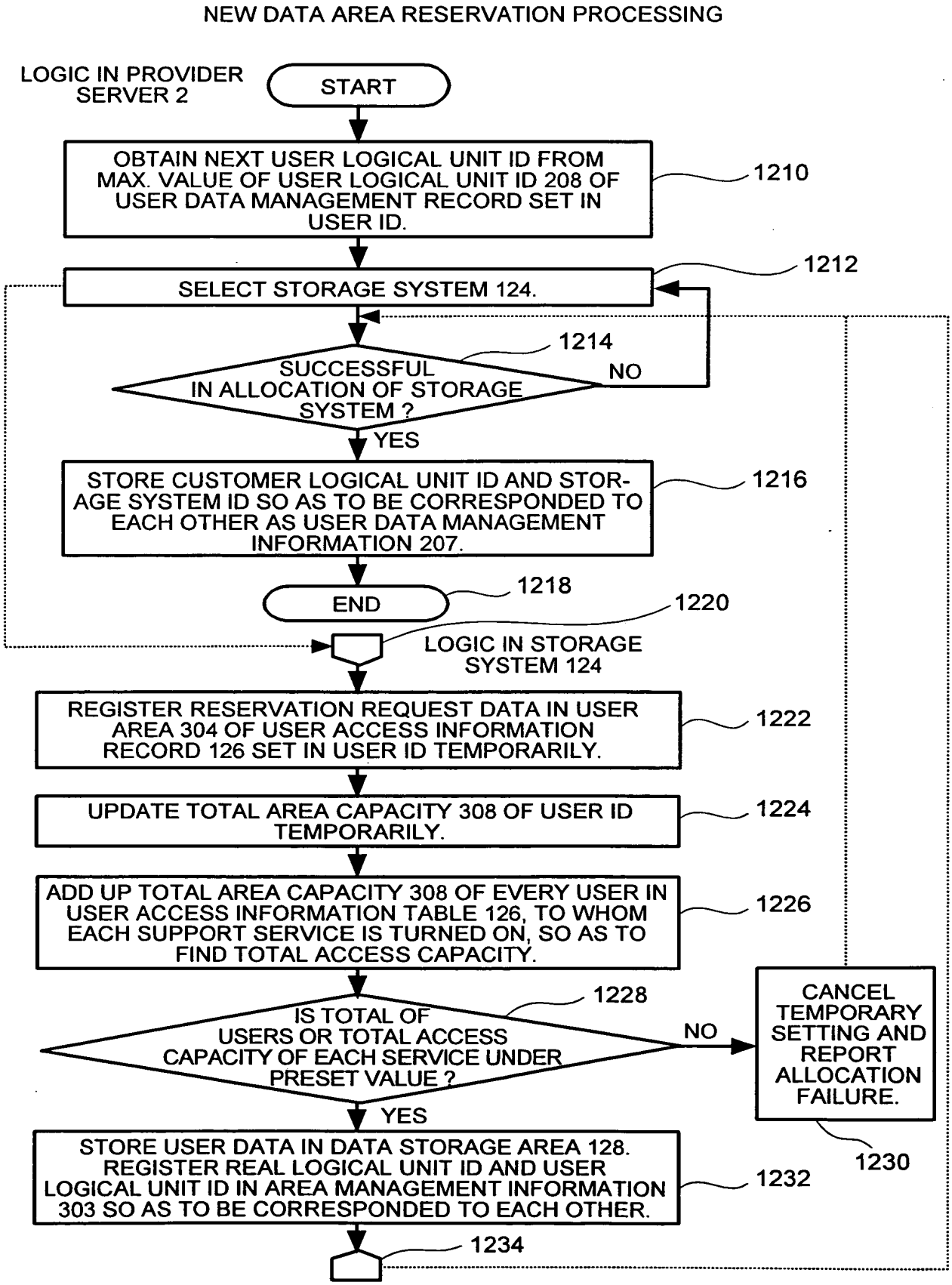
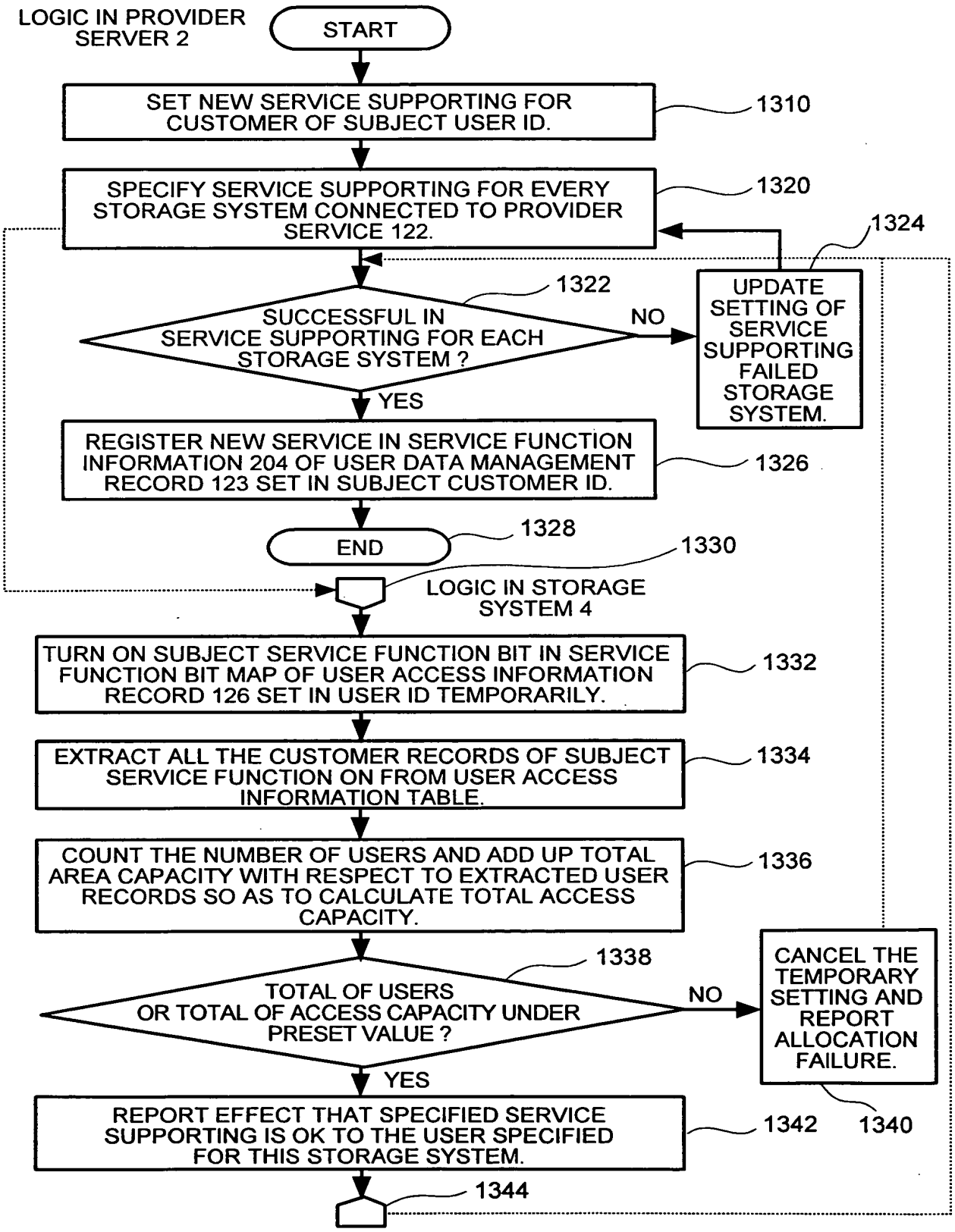

NEW DATA AREA RESERVATION PROCESSING
LOGIC IN PROVIDER SERVER 2
START
OBTAIN NEXT USER LOGICAL UNIT ID FROM MAX. VALUE OF USER LOGICAL UNIT ID 208 OF USER DATA MANAGEMENT RECORD SET IN USER ID.
1210
SELECT STORAGE SYSTEM 124.
1212
SUCCESSFUL IN ALLOCATION OF STORAGE SYSTEM ?
1214
NO
YES
STORE CUSTOMER LOGICAL UNIT ID AND STORAGE SYSTEM ID SO AS TO BE CORRESPONDED TO EACH OTHER AS USER DATA MANAGEMENT INFORMATION 207.
1216
END
1218
1220
LOGIC IN STORAGE SYSTEM 124
REGISTER RESERVATION REQUEST DATA IN USER AREA 304 OF USER ACCESS INFORMATION RECORD 126 SET IN USER ID TEMPORARILY.
1222
UPDATE TOTAL AREA CAPACITY 308 OF USER ID TEMPORARILY.
1224
ADD UP TOTAL AREA CAPACITY 308 OF EVERY USER IN USER ACCESS INFORMATION TABLE 126, TO WHOM EACH SUPPORT SERVICE IS TURNED ON, SO AS TO FIND TOTAL ACCESS CAPACITY.
1226
IS TOTAL OF USERS OR TOTAL ACCESS CAPACITY OF EACH SERVICE UNDER PRESET VALUE ?
1228
NO
CANCEL TEMPORARY SETTING AND REPORT ALLOCATION FAILURE.
1230
YES
STORE USER DATA IN DATA STORAGE AREA 128. REGISTER REAL LOGICAL UNIT ID AND USER LOGICAL UNIT ID IN AREA MANAGEMENT INFORMATION 303 SO AS TO BE CORRESPONDED TO EACH OTHER.
1232
1234

FIG.13

NEW SERVICE SUPPORTING REGISTRATION PROCESSING



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